

REMARKS

The amendment filed in the present case on August 23, 2005 added new Claims 25-35. The Office Action of November 3, 2005 is an incomplete Office Action because the patentability of Claims 25-35 was not considered. Thus, the finality of the rejection of the Office Action of November 3, 2005 is premature because the subject matter of at least new Claims 25-35 was not considered. The finality of the rejection should therefore be withdrawn.

Applicants draw the Office's attention to amended Claim 26 which requires that the rotating shafts of the mixing kneader have a combination of kneading and transporting elements. Unlike the presently claimed invention, the prior art cited by the Office, e.g., Tsubakimoto, does not disclose a mixing device having transporting elements on rotating shafts for conveying a monomer mixture from an upstream end of a mixing kneader to a downstream end of a mixing kneader. Instead, Tsubakimoto discloses rotating shafts having only kneading elements. For example, at column 2, lines 13-18 Tsubakimoto discloses:

The objects described above are accomplished by a method for the continuous production of a cross-linked polymer, which comprises the steps of continuously feeding the aqueous solution of a monomer capable of being converted by aqueous solution polymerization into a water-containing cross-linked gel polymer and a polymerization initiator to a vessel provided with a plurality of mutually parallel rotating stirring shafts, finely dividing a water-containing gel polymer issuing from the polymerization in progress by the shearing force of stirring blades generated by the rotation of the aforementioned stirring shafts, and continuously discharging the resultant finely divided water-containing gel polymer out of the vessel. (See col. 2, lines 7-20).

Tsubakimoto therefore discloses a device that includes stirring blades on stirring shafts but does not disclose shafts that have transporting elements such as the transporting elements recited in previously presented Claim 26.

The invention claimed in at least Claim 26 is different from the process described in Tsubakimoto. The presence of transporting elements on the rotating shafts of the mixing kneader recited in the present claims functions to reduce back mixing in the device (e.g., the mixing kneader). In contrast, Tsubakimoto discloses a process wherein enhanced back mixing is preferred. This is evident, for example, from the disclosure at column 7, lines 47-57:

Further by the method of this invention, the generation of the heat of polymerization reaction is uniform along the course of time because the finely divided water-containing gel polymer retained within the reaction vessel on the freshly supplied aqueous monomer solution are uniformly mixed and the polymerization of the monomer occurs on the surface of the polymer gels. Thus, the removal of the heat of the polymerization reaction and the maintenance of the temperature of the polymerization system at a constant level are easy. (Col. 7, lines 47-57).

Contrary to the presently claimed invention which requires that the monomer mixture is conveyed by rotating shafts having transporting elements, the process of Tsubakimoto states that polymer gels are retained (e.g., as opposed to transported) within the prior art mixing device.

The figures of Tsubakimoto describe various mixing kneaders such those of Figs. 4 and 5. Figure 5 discloses various rotating components of the prior art mixing device. For example, Figure 5 shows a stirring blade as reference no. 26 (see col. 5, lines 30 to 35); a discharge screw is identified as reference no. 29; and a paddle feeder is identified as reference no. 30 (see col. 5, lines 44-45). A side view of the device of Fig. 5 is provided as Fig. 4 where it is readily evident that the stirring blades are two axially parallel rotating shafts that are used to stir the mixture of Tsubakimoto. The figures of Tsubakimoto do not disclose an embodiment where two rotating shafts each having transporting elements are present. This is in contrast to the claimed invention which requires "at least two axially parallel rotating shafts having a plurality of kneading and transporting elements".

Tsubakimoto even distinguishes the prior art process from other processes as follows:

The method of this invention is entirely different in operating principle from the method of Japanese Patent Laid-Open No. SHO56(1981)-32514 which causes the materials to be moved in a manner of piston flow from the entrance to the exit...(See col. 8, lines 11-15).

In Tsubakimoto there is significant back-mixing because the axially parallel rotating shafts contain mixing elements and not transporting elements. While these elements may be effective at mixing a monomer mixture, they are not effective at transporting monomer mixture from an upstream end to a downstream end of the prior art mixing device. The Examples of Tsubakimoto further support this interpretation by showing that, for example, Example 1 has a residence time of 45 minutes. This may be contrasted with the residence times of 30, 20 and 10 minutes for previously presented Claims 30-32.

Independent Claim 10 has been amended to state that the monomer mixture is conveyed from an upstream end of the mixing kneader to a downstream end of the mixing kneader by the continuous conveying action of the transporting elements of the rotating shafts. Applicants submit that the prior art relied upon by the Office does not disclose or suggest the presently claimed invention because the cited prior art does not disclose any embodiment wherein two rotating shafts each having transporting elements are used to convey a monomer mixture through the prior art device.

Applicants submit that entry of the amendment to Claim 10 and consideration of the present arguments is appropriate because the finality of the Office Action of November 3, 2005 is premature.

With respect to the rejections in view of Irie (U.S. 4,920,202), Applicants submit that a process, that requires the conveying of a monomer mixture by two axially parallel rotating shafts each having transporting elements such as the process presently claimed cannot be

anticipated or rendered obvious by Irie because Irie does not describe the use of a device having transporting elements for conveying a monomer mixture.

Applicants further draw the Office's attention to previously presented Claims 30-32 wherein the residence time of the monomer mixture is 30 minutes, 20 minutes, and 10 minutes, respectively. Applicants submit that the subject matter of Claims 30-32 is further patentable over Irie on the grounds that Irie discloses examples having a long reaction time (e.g., 60 minutes; see col. 6, line 64) which is indicative of a process that includes significant back-mixing and does not use axially parallel rotating shafts having transporting elements as a means of moving a monomer mixture through the prior art device.

Further, previously presented Claim 29 requires that the axially parallel rotating shafts have L-shaped and/or U-shaped attachments. Tsubakimoto discloses rotating shafts that may have, for example, sigma type, S-type, Banbury type or fish-tail type mixing elements. L- or U-shaped transporting elements are not disclosed. Thus, the subject matter of dependent Claim 29 is further patentable in view of Tsubakimoto.

As stated above, Applicants submit the presently claimed invention is novel and not obvious in view of the prior art of record at least because the prior art does not disclose the use of a mixing device having transporting elements used for conveying a monomer mixture from an upstream and to a downstream end of the mixing device. The presently claimed invention is further not obvious in view of the prior art on the grounds that the prior art teaches enhanced back mixing by the use of stirring elements on rotating shafts instead of the

transporting elements required in the claimed invention. Applicants respectfully request entry and consideration of the amendment to Claim 1, and the allowance of all now-pending claims.

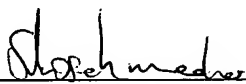
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